

## RECENT LITERATURE.

Stone on 'Methods of Recording and Utilizing Bird-Migration Data.' — In a paper of thirty pages<sup>1</sup> Mr. Witmer Stone discusses present methods of recording and utilizing bird-migration data. As is well known, Mr. Stone has long been active in this line of research and has given the subject of migration data thorough consideration, so that his conclusions on the subject are of special interest.

The data mainly utilized in the present paper are those collected during the last seven years by the Delaware Valley Ornithological Club, by thirty-five observers, within a ten-mile radius of the center of Philadelphia. These observations are carefully analyzed from various points of view and the results graphically shown by means of maps and diagrams, the latter, by means of curves, showing the relation of migration movements to meteorological conditions for the years 1902-1906.

In general, migration records are, for the most part, the work of single observers at isolated stations, and until very recently no attempt has been made to compare the records of several observers at practically the same locality. This was first done by Mr. Stone for Philadelphia in 1905 (*Condor*, 1906, pp. 88-90), and later by Prof. W. W. Cooke for Washington (*Auk*, 1907, pp. 346-348). In general our records give only the date of 'first arrival'; the U. S. Department of Agriculture (Biological Survey) schedules also call for arrival of the main flight or 'bulk.' Reasons are given for considering both these methods unsatisfactory, from the very nature of the case, since the first arrival may be merely a straggler, and the 'bulk arrival' a matter of estimate, subject to the element of personal equation. In commenting on these points Mr. Stone calls attention to the fact "that while a date of 'first arrival' may be perfectly accurate for the limited area covered by an observer, it would differ very materially from the earliest date of arrival for the species in a circle of five or ten miles around that observer's station," as demonstrated by the records for the vicinity of Philadelphia. Thus "the average date of arrival for a number of years, based upon the observations of a single individual, varies materially from the average date obtained by another equally accurate observer stationed a few miles distant." He concludes "that results based upon such individual records are really of but little value for comparative work, so great is the possibility of error." This is rather disheartening, not to say startling. Mr. Stone, however, suggests an obviously better method, which it is to be hoped will be systematically adopted by local bird clubs and societies, He says:

"After discrediting the value of individual records, one must naturally suggest some method of recording migration by which results sufficiently

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<sup>1</sup> Methods of Recording and Utilizing Bird-Migration Data. By Witmer Stone. *Proc. Acad. Nat. Sci. Philadelphia*, 1898, pp. 128-156, July 22, 1908.

accurate for comparative work are to be obtained. This, I think, is to be found by securing a large number of observers in a limited area and by combining their results, as has been done by the Delaware Valley Ornithological Club in the vicinity of Philadelphia. If we had seven-year records kept by thirty-five individuals within ten miles of Washington, and a similar series within ten miles of Boston for comparison with the Philadelphia series, then I think we should be able to estimate with some degree of accuracy the progress of migration between these points."

Mr. Stone's discussion of 'Waves and their Components' is of special interest. It is based on the records of forty-seven common species, for which the data are fullest, and covers the years 1904-1907. He formally tabulates eleven waves, but gives the number as varying from eleven to fourteen for the spring migration, to the consideration of which the present discussion is restricted. He finds "a remarkable correspondence in the species which make up each wave. And the same 'wave' may be recognized through a number of years by its component species, though its date may vary considerably." Sometimes a movement may be interrupted by unsuitable weather and be resumed again later, making two apparent waves in one year which correspond to one in other years... It seems then that certain species migrate together, advance stragglers of some accompanying the bulk movement of others, and that each species is ready for migration at approximately the same time each year, the exact date depending upon a favorable combination of meteorological conditions."

Mr. Stone's paper concludes with a tabulated summary of the arrival dates of 90 species for the years 1902-1907, based upon the records of 25 to 35 observers for each year, "all located within ten miles of the center of Philadelphia." The table gives under 'first arrival' the average date and extreme dates for the whole period, and under 'bulk arrival' the date for each year and the average date for the whole period. It is noticeable that the length of the interval between average 'first arrival' and 'average bulk arrival' varies markedly in different species. Thus, for 70 species for which the record is complete, the interval between 'first arrival' and 'bulk' is from 4 to 8 days in the case of 45 species, 9 to 15 days in the case of 19 species, and 16 to 30 days in the case of 6 species. The last 6 are all early migrants, and to some extent winter residents.

A vast amount of patient and painstaking labor, continued through many years, has been expended by Mr. Stone to reach the results here so clearly presented, showing that his interest in the subject is both deep and lasting; and he has well earned the hearty thanks and congratulations of all his fellow-workers in this field of research. It is to be hoped that his work and that of the other members of the Delaware Valley Ornithological Club will incite other local ornithological associations to similar effort.

We are not to infer, however, that all previous work on bird migration by individual observers has been in vain, and that our general conceptions of the average date of the spring arrival of birds based on the observations of isolated (as opposed to organized) observers is to any great extent

erroneous, or that the supposed rate of progress of migrant birds is not approximately correct, although, it must be granted, not yet grounded on satisfactory data and proper methods. The chances are that the inaccuracies due to faulty methods or insufficient data result in the main in approximately correct averages, the errors largely counterbalancing each other. Yet we have at present, it must be admitted, crude results as opposed to scientific accuracy.— J. A. A.

**Birds of the New Haven Region.**—‘A List of the Birds of the New Haven Region,’ compiled by a Committee, forms Bulletin No. 1 of the New Haven Bird Club (pp. 32), issued in May of the present year. The Committee consists of six members of the Club,<sup>1</sup> with Dr. L. B. Bishop as Advisory Committee. The region is divided into five areas, which are described as regards their topography and ornithological features. Following this preliminary matter is the annotated list, numbering 217 species, with a supplementary list of nearly a hundred species which have become extinct or are so rare as not to be ordinarily found within the region. The list is intended as “a brief and simple guide to the birds of the New Haven region,” to serve as an aid to “teachers and others interested in knowing what birds to look for and to a certain extent when and where to look for them.” It is based for the most part on the field notes of the members of the committee taken within the last few years, and thus may be regarded as reflecting present conditions. The annotations relate to the seasons of occurrence, abundance, and special haunts of the species within the region. The list will no doubt well serve its purpose, and is a commendable piece of work, as regards both its intent and execution.— J. A. A.

**‘A Check List of Rhode Island Nesting Birds.’**—This ‘List’<sup>2</sup> is based on records covering the period 1890 to 1908, and comprises only species known to breed in the State. These number 104, with a supplemental list of 15 others that have been reported as breeding in Rhode Island, but of which the Commissioners have been unable to find “accurate or satisfactory nesting data.” It is not assumed that no others than those admitted to the main list breed in the State, it being thought best to have the list accurate as far as it goes. Several of the species given in the second list doubtless formerly bred in the State, if they do not at the present time. The list is printed on only one side of the paper, and the annotations consist of a definite breeding record, with the authority therefor, and the situation of the nest and number of eggs, without any remarks on the abundance

<sup>1</sup> Freeman F. Burr, Chairman; Philip L. Buttrick, Alfred W. Honywill, Jr., Dwight B. Pangburn, Aretas A. Saunders, and Clifford H. Pangborn.

<sup>2</sup> A Check List of Rhode Island Nesting Birds with Data.—Published by The Commissioners of Birds, Charles H. Remington, Chairman, Providence Co., William H. Thayer, Bristol Co., Alexander O. D. Taylor, Newport Co., Edwin R. Lewis, Washington Co., W. Gordon Reed, 2nd Kent Co.—Copyright 1908 By C. H. Remington—16 mo., ll. 26, one half-tone plate.